General

Guideline Title

Perioperative management of HIV-infected patients.

Bibliographic Source(s)

New York State Department of Health. Perioperative management of HIV-infected patients. New York (NY): New York State Department of Health; 2012 Jan. 9 p. [27 references]

Guideline Status

This is the current release of the guideline.

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- March 22, 2016 – Opioid pain medicines : The U.S. Food and Drug Administration (FDA) is warning about several safety issues with the entire class of opioid pain medicines. These safety risks are potentially harmful interactions with numerous other medications, problems with the adrenal glands, and decreased sex hormone levels. They are requiring changes to the labels of all opioid drugs to warn about these risks.

Recommendations

Major Recommendations

The quality of evidence (I-III) and strength of recommendation (A-C) are defined at the end of the "Major Recommendations" field.

Introduction

Key Point:

Neither CD4 cell count nor human immunodeficiency virus (HIV) viral load should be used as sole determinants of a given patient's surgical

risk (Madiba, Muckart, &, Thomson, 2009).

Risk to the Surgical Team

Universal surgical precautions that apply to all patients should be followed. (AIII)

Preoperative Evaluation for HIV-Infected Patients

The preoperative evaluation of HIV-infected patients should be the same as that for non-HIV-infected patients; however, clinicians should carefully assess for the following conditions that are more prevalent in the HIV-infected population (AIII):

- Hepatic and renal dysfunction
- Coronary artery disease and cardiac risk
- Coagulopathy, thrombocytopenia, and neutropenia
- Active alcohol or substance use, including both prescription and non-prescription drug use
- History of prior infection/colonization with methicillin-resistant *Staphylococcus aureus* (MRSA), particularly in men who have sex with men (MSM)
- Drug allergies

Clinicians should obtain urine toxicology, with patient consent, if the substance use history is unreliable and there are concerns about substance use. Elective surgery should be deferred until active substance use has been addressed. (AIII)

Individuals with a history of MRSA colonization or infection should receive vancomycin instead of cefazolin for prophylaxis when indicated. (AIII)

Table. Surgical Management Considerations for HIV-Infected Patients with Comorbidities and Other Conditions

Comorbidity Risks	Pre- and Perioperative Recommendations
Hepatic Dysfunction • Increased prevalence of hepatic dysfunction from ART or from preexisting liver disease. Surgical Risk • Co-infection with HBV or HCV may predispose to increased bleeding risk due to coagulopathy or thrombocytopenia. Related Guidelines See the NGC summary of the NYSDoH guideline Hepatitis B Virus, and the NYSDoH guideline Hepatitis C Virus; see also Antiretroviral Therapy: Hepatic Impairment Dosing	• Assess for hepatic dysfunction preoperatively because of the possible impact on dosing or selection of anesthetics, perioperative antibiotics, and other medications.
Renal Dysfunction • Increased prevalence of renal dysfunction from HIV-associated nephropathy (HIVAN) and other causes. Related Guidelines *Kidney Disease in HIV-Infected Patients*	• Assess for renal dysfunction preoperatively because of the possible impact on dosing or selection of anesthetics, perioperative antibiotics, and other medications. • If there are renal function changes in the perioperative period, review ART regimen for agents that may require renal dose adjustment.
Coronary Artery Disease and Cardiac Abnormalities	• Assess for coronary artery disease preoperatively.

Comorbidity Risks	Pre- and Perioperative Recommendations
• Increased prevalence of CAD from metabolic dysfunction due to HIV infection and/or ART. • QT prolongation or other cardiac abnormalities may occur in advanced HIV infection or in patients receiving certain medications[a]	• Perform careful review of preoperative EKG results.
Respiratory Complications • Prevalence of underlying pulmonary disease is increased due to the increased risk for bacterial pneumonia and high prevalence of smoking in HIV-infected patients. Surgical Risk • Risk for postoperative pneumonia is increased in HIV-infected patients. For interventions to promote smoking cessation, see the NYSDoH guideline Smoking Cessation in HIV-Infected Patients.	• Carefully evaluate for respiratory complications in the perioperative period.
Thrombocytopenia and Neutropenia • Idiopathic thrombocytopenic purpura may occur at any stage of HIV infection. • Neutropenia is common in HIV-infected individuals with severe immunosuppression[b]	• Consult with hematologist prior to surgical procedure when platelet counts approach 50,000 per µl. • Routine use of G-CSF not recommended (Kaplan et al., 2009) but in perioperative period may consider G-CSF[c] use to maintain absolute neutrophil count >1,000 cells/mm^3 (CIII).(Mohri et al., 1995; Kedzierska et al., 1998)
Hemophilia	• Coordination between surgical team and hematologist is recommended for transfusion of factor replacement in anticipation of surgery
Substance Use (SU) • SU disorders are more prevalent in HIV-infected individuals than in the general population. Surgical Risk • Increased risk for complications from surgery and anesthesia, notably cardiac complications associated with cocaine use. • Increased risk for withdrawal symptoms in the postoperative period for unrecognized alcohol, benzodiazepine, or heroin use[d] Related Guidelines • See the NYSDoH guideline Care of the Hospitalized HIV-Infected Substance User	• Obtain detailed history of substance use. • Consider obtaining urine toxicology screen, with patient consent. • For elective surgery, observe appropriate period of abstinence with the use of substitute medications such as methadone or benzodiazepines as appropriate.
Methicillin Resistant Staphylococcus aureus (MRSA)	• Assess for a history of previous MRSA infection/colonization,

Comorbidity Risks • Community-acquired MRSA infection is more common in MSM than in the general population For additional information, see the IDSA standard guidelines for patients with infection caused by MRSA.	Pre- and Perioperative Recommendations • particularly in MSMs • Use vancomycin instead of cefazolin for prophylaxis when indicated in patients with positive history of MRSA.
Drug Allergies • HIV-infection is associated with a higher incidence of medication allergies.	• Obtain a careful history of allergies.

ART, antiretroviral therapy; CAD, coronary artery disease; EKG, electrocardiogram; G-CSF, granulocyte colony-stimulating factor; HBV, hepatitis B virus; HCV, hepatitis C virus; IDSA, Infectious Diseases Society of America; MSM, men who have sex with men; MRSA, methicillin-resistant *Staphylococcus aureus*; NGC, National Guideline Clearinghouse; NYSDoH, New York State Department of Health

[a] Anti-arrhythmics, methadone, protease inhibitors (PIs), antipsychotics, or macrolide antibiotics can cause QT prolongation or other cardiac abnormalities, especially if more than one such agent is administered concurrently.

[b] Neutropenia may be caused by medications (e.g., zidovudine [ZDV], trimethoprim-sulfamethoxazole [TMP/SMX]), HIV infection itself, bone marrow infiltration from malignancy or systemic infection.

[c] G-CSF is recommended over granulocyte macrophage-colony-stimulating factor (GM-CSF) due to theoretical concerns regarding potential stimulation of HIV replication by the latter, although the possible mechanism by which GM-CSF might affect HIV-1 replication remains unclear.

[d] Alcohol withdrawal may be life-threatening if symptoms are not recognized early.

Perioperative Medication Management for HIV-Infected Patients

Clinicians should continue antiretroviral therapy (ART) in the perioperative period with as little interruption as possible, particularly for patients co-infected with hepatitis B virus (HBV) who are receiving an ART regimen that also has activity against HBV. When ART interruption is necessary, all components of the regimen should be stopped and clinicians should consult with a provider who has experience in management of ART. (AI)

For patients who require prophylaxis for *Pneumocystis jirovecii* pneumonia (PCP) and are unable to receive oral medications for more than 1 week, trimethoprim-sulfamethoxazole (TMP/SMX) should be administered intravenously. If there is a contraindication to TMP/SMX, pentamidine should be administered intravenously or by inhalation. (AIII)

Patients with a history of MRSA colonization or infection should receive vancomycin instead of cefazolin for prophylaxis when indicated. (AIII)

Clinicians should assess for potential drug-drug interactions before new medications are introduced. (AIII)

Potential Drug-Drug Interactions

Clinicians should consult a reliable drug interaction resource to identify potential interactions with antiretroviral medications, even for routine administration of commonly used medications in the perioperative period.

Refer to the original guideline document for online resources providing information on antiretroviral drug interactions.

Postoperative Management of HIV-Infected Patients

HIV-infected patients should be mobilized postoperatively as soon as medically feasible because of increased risk of thromboembolic complications. (AII)

Clinicians should consider spontaneous pneumothorax in the differential diagnosis of acute onset dyspnea in patients with active PCP or a history of PCP. (AIII)

Clinicians should not withhold treatment for pain solely because a patient has a history of substance use. Rather, standard pain assessment and

treatment protocols should be followed. (AII)

Definitions:

Quality of Evidence for Recommendation

I. One or more randomized trials with clinical outcomes and/or validated laboratory endpoints
II. One or more well-designed, non-randomized trials or observational cohort studies with long-term clinical outcomes
III. Expert opinion

Strength of Recommendation

A. Strong recommendation for the statement
B. Moderate recommendation for the statement
C. Optional recommendation

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

- Human immunodeficiency virus (HIV)
- Conditions requiring surgery related to HIV medical care
- Comorbidities prevalent in the HIV-infected population such as hepatic and renal dysfunction; coronary artery disease and cardiac risk; coagulopathy, thrombocytopenia, and neutropenia; active alcohol or substance use; history of prior infection/colonization with methicillin-resistant *Staphylococcus aureus* (MRSA); drug allergies

Guideline Category

Evaluation

Management

Risk Assessment

Clinical Specialty

Allergy and Immunology

Family Practice

Infectious Diseases

Internal Medicine

Surgery

Intended Users

Advanced Practice Nurses

Health Care Providers

Hospitals

Nurses

Physician Assistants

Physicians

Public Health Departments

Substance Use Disorders Treatment Providers

Guideline Objective(s)

To provide guidelines for the perioperative management of human immunodeficiency virus (HIV)-infected patients

Target Population

Human immunodeficiency virus (HIV)-infected individuals undergoing necessary surgical procedures

Interventions and Practices Considered

1. Risk to the surgical team should be considered and universal surgical precautions should be followed
2. Pre-and perioperative evaluation of:
    - Hepatic and renal dysfunction
    - Coronary artery disease and cardiac risk
    - Coagulopathy, thrombocytopenia, and neutropenia
    - Active alcohol or substance use
    - History of prior infection/colonization with methicillin-resistant *Staphylococcus aureus* (MRSA)
    - Drug allergies
3. Preoperative urine toxicology
4. Use of vancomycin in patients with history of MRSA colonization
5. Granulocyte colony-stimulating factor (G-CSF) use to maintain absolute neutrophil count >1,000 cells/mm^3
6. Continuing antiretroviral therapy (ART) in the perioperative period with as little interruption as possible
7. Use of intravenous (IV) trimethoprim-sulfamethoxazole (TMP/SMX) or inhaled or IV pentamidine for patients who are unable to continue oral medication for *Pneumocystis jirovecii* pneumonia (PCP)
8. Assessment for potential drug-drug interactions
9. Postoperative mobilization
10. Considering spontaneous pneumothorax in the differential diagnosis of acute onset dyspnea in patients with active PCP or a history of PCP
11. Use of standard pain assessment and treatment protocols for postoperative pain management

Major Outcomes Considered

Risk for perioperative and postoperative complications

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

MEDLINE was searched up to January 2012 with use of appropriate key words, (e.g. preoperative evaluation; medication management, surgical risks). Due to lack of randomized controlled trials on this subject, evidence is limited to qualitative studies, reviews, and case reports.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Expert Consensus (Committee)

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Quality of Evidence for Recommendation

I. One or more randomized trials with clinical outcomes and/or validated laboratory endpoints
II. One or more well-designed, non-randomized trials or observational cohort studies with long-term clinical outcomes
III. Expert opinion

Methods Used to Analyze the Evidence

Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

AIDS Institute clinical guidelines are developed by distinguished committees of clinicians and others with extensive experience providing care to people with human immunodeficiency (HIV) infection. Committees* meet regularly to assess current recommendations and to write and update guidelines in accordance with newly emerging clinical and research developments.

The Committees* rely on evidence to the extent possible in formulating recommendations. When data from randomized clinical trials are not available, Committees rely on developing guidelines based on consensus, balancing the use of new information with sound clinical judgment that results in recommendations that are in the best interest of patients.

*Current committees include:

- Medical Care Criteria Committee

- Committee for the Care of Children and Adolescents with HIV Infection
- Dental Standards of Care Committee
- Mental Health Guidelines Committee
- Committee for the Care of Women with HIV Infection
- Committee for the Care of Substance Users with HIV Infection
- Physicians' Prevention Advisory Committee
- Pharmacy Advisory Committee

Rating Scheme for the Strength of the Recommendations

Strength of Recommendation

A. Strong recommendation for the statement
B. Moderate recommendation for the statement
C. Optional recommendation

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Description of Method of Guideline Validation

All guidelines developed by the Committee are externally peer reviewed by at least two experts in that particular area of patient care, which ensures depth and quality of the guidelines.

Evidence Supporting the Recommendations

References Supporting the Recommendations

Kaplan JE, Benson C, Holmes KH, Brooks JT, Pau A, Masur H, Centers for Disease Control and Prevention (CDC), National Institutes of Health, HIV Medicine Association of the Infectious Diseases Society of America. Guidelines for prevention and treatment of opportunistic infections in HIV-infected adults and adolescents: recommendations from CDC, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. MMWR Recomm Rep. 2009 Apr 10;58(RR-4):1-207; quiz CE1-4. PubMed

Kedzierska K, Rainbird MA, Lopez AF, Crowe SM. Effect of GM-CSF on HIV-1 replication in monocytes/macrophages in vivo and in vitro: a review. Vet Immunol Immunopathol. 1998 May 15;63(1-2):111-21. [52 references] PubMed

Madiba TE, Muckart DJ, Thomson SR. Human immunodeficiency disease: how should it affect surgical decision making. World J Surg. 2009 May;33(5):899-909. [74 references] PubMed

Mohri N, Akamo Y, Takeyama H, Mizokami M, Yuasa H, Mizuno I, Shinagawa N, Manabe T. Perforated acute appendicitis in a patient with AIDS/HIV infection: report of a case. Surg Today. 1995;25(1):62-4. PubMed

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate perioperative management of human immunodeficiency virus (HIV)-infected individuals undergoing necessary surgical procedures

Potential Harms

Potential drug-drug interaction in patients receiving antiretroviral therapy (ART) is increased due to the extensive cytochrome P450 interactions with both protease inhibitors (PIs) and non-nucleoside reverse transcriptase inhibitors (NNRTIs).

Contraindications

Contraindications

Caution should be used with anxiolytics and sedative/hypnotics, many of which have interactions with protease inhibitors (PIs) that may be severe enough for their use to be contraindicated. For example, the common anesthesia medicine midazolam is contraindicated in combination with ritonavir. General anesthetics, such as halothane and enflurane, however, do not have significant interactions. Proton pump inhibitors, and to a lesser extent antacids and H2 blockers, may adversely affect the absorption of the PI atazanavir.

Qualifying Statements

Qualifying Statements

When formulating guidelines for a disease as complex and fluid as human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), it is impossible to anticipate every scenario. It is expected that in specific situations, there will be valid exceptions to the approaches offered in these guidelines and sound reason to deviate from the recommendations provided within.

Implementation of the Guideline

Description of Implementation Strategy

The AIDS Institute's Office of the Medical Director directly oversees the development, publication, dissemination and implementation of clinical practice guidelines, in collaboration with The Johns Hopkins University, Division of Infectious Diseases. These guidelines address the medical management of adults, adolescents and children with human immunodeficiency virus (HIV) infection; primary and secondary prevention in medical settings; and include informational brochures for care providers and the public.

Guidelines Dissemination

Guidelines are disseminated to clinicians, support service providers, and consumers through mass mailings and numerous AIDS Institute-sponsored educational programs. Distribution methods include the HIV Clinical Resource website, the Clinical Education Initiative (CEI), the AIDS Educational Training Centers (AETC), and the HIV/AIDS Materials Initiative. Printed copies of clinical guidelines are available for order from the New York State Department of Health (NYSDOH) Distribution Center.

Guidelines Implementation

The HIV Clinical Guidelines Program works with other programs in the AIDS Institute to promote adoption of guidelines. Clinicians, for example, are targeted through the CEI and the AETC. The CEI provides tailored educational programming on site for health care providers on important topics in HIV care, including those addressed by the HIV Clinical Guidelines Program. The AETC provides conferences, grand rounds and other programs that cover topics contained in AIDS Institute guidelines.

Support service providers are targeted through the HIV Education and Training initiative which provides training on important HIV topics to non-physician health and human services providers. Education is carried out across the State as well as through video conferencing and audio conferencing.

The HIV Clinical Guidelines Program also works in a coordinated manner with the HIV Quality of Care Program to promote implementation of HIV guidelines in New York State. By developing quality indicators based on the guidelines, the AIDS Institute has created a mechanism for measurement of performance that allows providers and consumers to know to what extent specific guidelines have been implemented.

Finally, best practices booklets are developed through the HIV Clinical Guidelines Program. These contain practical solutions to common problems related to access, delivery or coordination of care, in an effort to ensure that HIV guidelines are implemented and that patients receive the highest level of HIV care possible.

Implementation Tools

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

IOM Domain

Effectiveness

Patient-centeredness

Safety

Identifying Information and Availability

Bibliographic Source(s)

New York State Department of Health. Perioperative management of HIV-infected patients. New York (NY): New York State Department of Health; 2012 Jan. 9 p. [27 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Jan

Guideline Developer(s)

New York State Department of Health - State/Local Government Agency [U.S.]

Source(s) of Funding

New York State Department of Health

Guideline Committee

Medical Care Criteria Committee

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Financial Disclosures/Conflicts of Interest

Financial disclosures for committee members are available upon request from jciekot@hivguidelines.org.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the New York State Department of Health AIDS Institute Web site .

Availability of Companion Documents

The following is available:

- Kidney and liver transplantation in people with HIV. Video. Available from the Clinical Education Initiative Web site .

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on August 16, 2012. This summary was updated by ECRI Institute on June 2, 2016 following the U.S. Food and Drug Administration advisory on Opioid pain medicines.

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